
PROCEDURE **Department of Natural Resources****Date:** **May, 2000****Cancels:****PR 14-005-060** **COMPLETING A SILVICULTURAL PRESCRIPTION IN PLANNING AND TRACKING****APPLICATION** All forested lands managed under the direction of the Lands and Resources Division.**DISCUSSION**

This procedure is to be used when developing silvicultural prescriptions for all forest ecosystems on DNR-managed lands and for entering those prescriptions into the Planning and Tracking (P&T) system.

A silvicultural prescription is a series of steps designed to document forest management unit (FMU) objectives through one or more rotations, and then to describe how those objectives will be met. Determining the FMU objectives is the first step to completing the silvicultural prescription (see [PR 14-005-010](#)). If the FMU objectives for the stand have not been defined, complete procedure [PR 14-005-010](#) before completing this procedure.

The FMU objectives (seen as "overall unit objective" in the P&T screen) contribute to broader, landscape-level objectives (i.e., Habitat Conservation Plan (HCP), ecosystem, trust, etc.) as well as to improved site productivity. Clear FMU objectives are essential when considering silvicultural prescription options to achieve the objectives. These objectives are our legacy. In future years, few will remember who laid-out a sale, who monitored compliance during the harvest, or why a particular residual tree was left. However, future managers will be able to read the objectives and prescription, and perform the necessary actions to complete today's vision of the future forest.

The silvicultural prescription consists of an overall unit objective (FMU objective) and an associated schedule of activities to achieve the objective over time. Typically, it takes many decades to achieve the overall unit objective and each management activity may not contribute to immediate achievement of the objective. However, each activity must be designed to ultimately contribute to the achievement of the overall objective.

When to Schedule Silvicultural Activities

Silvicultural activities should be scheduled on a routine basis. To ensure that budget is available, by January 30 of every even numbered year, input into P&T all activities that are expected to be accomplished in the subsequent biennium. This is when the silvicultural budget process is initiated. The budget is constructed for each of the trusts. Thus, accurate trust-level information is critical to securing adequate funding.

Some activities will be scheduled as much as 42 months in advance. Most activities such as pre-commercial thinning (PCT) can be accurately predicted this far in advance. However, certain activities such as vegetation control and planting can be affected by factors that will change after the activity is scheduled. Make the best prediction and schedule the activity, even when factors are uncertain. On a state-wide basis, the process tends to balance out between trusts. Failure to schedule activities that have

some uncertainty, but that can be reasonably expected to be completed, will result in the non-availability of funds and the activity will not be done.

Schedule activities as far into the future as possible. A timber harvest should normally have activities scheduled through age 20. As the trees in a stand reach commercial size, there may be one or several future activities scheduled, or several future harvests planned which leave a clear plan for future managers.

Where to Schedule Silvicultural Activities




Silvicultural activities are scheduled in P&T as part of the silvicultural prescription process. A group of buttons on the lower left side of the silvicultural prescription screen allows quick movement from one type of activity to another.

It is possible to view and modify more than one FMU or management activity by going to the "schedule activities screen." This screen allows changes to be made to dates and crew type and changes the information in the prescription. This is a quick and efficient way to update many scheduled activities.

How to Schedule Silvicultural Activities

P&T requires complete records. Thus you cannot partially schedule an activity. You will not be allowed to save an incomplete record. Be prepared to answer all the necessary questions to complete the record.







This procedure defines the necessary thought processes to reach an acceptable silvicultural prescription. An acceptable prescription must:

-  meet the stated FMU objectives,
-  achieve the FMU objective in the most cost effective way possible, and
-  have an acceptable level of risk.




Recorded plans in P&T are a lasting legacy and ensure that today's vision for management has the potential to be realized in the long term.






Action

1. Ensure that the stated FMU objective is achievable given the site characteristics and identify any site characteristics that may be limiting (see [PR 14-005-010](#)).
2. Identify more than one set of treatments that will achieve the FMU objectives. The treatment options must complete the rotation of the stand through the regeneration harvest. If the stand is currently being considered for regeneration harvest, treatments must consider a complete rotation (i.e., through the end of the next regeneration harvest). Consider the following silvicultural activities when developing the silvicultural prescription:






-  site preparation ([GL 14-006-020](#)),
-  controlling competing vegetation ([PR 14-006-040](#)),
-  thinning,
 -  pre-commercial thinning ([PR 14-006-050](#)),
 -  smallwood thinning ([PR 14-006-070](#)), and
 -  older-stand thinning ([PR 14-006-080](#)),



-  pruning ([PR 14-006-060](#)),
-  fertilizing (PR 14-006-100), and
-  regeneration harvesting ([PR 14-006-090](#))

-  selection (only uneven-aged),
-  phased patch (variable retention),
-  seedtree (short-term temporary retention or dispersal retention),
-  shelterwood (temporary retention), and
-  clearcut (regeneration harvest with legacy retention).

Note, the bullets under regeneration harvesting use the terms that are currently displayed in P&T, followed by DNR's current (preferred) terminology.

3. Conduct an economic analysis using DNR's Intensive Management Program Simulator DNRIMPS or the Forest Vegetation Simulator (FVS) for two or more of the preferred treatment options. Determine the economic return for each option that achieves the objective.
 - a. Select the correct projected regeneration harvest age. Assume one of the following:
 -  140 years for Habitat Conservation Plan (HCP) nesting, roosting, and foraging (NRF) areas,
 -  80 years for HCP dispersal areas,
 -  75 years for HCP hydrologic maturity,
 -  80 years for normal (without constraints) east-side lands, or
 -  refer to the table at the end of procedure [PR 14-005-020](#) for the correct regeneration harvest ages for stands with objectives other than those listed above for west-side lands.
4. Evaluate the risk of failure for the silvicultural prescription options with the highest present net worth.
 - a. Evaluate the stand to determine the presence, and degree of impact, of insects and/or disease.
 - b. Favor silvicultural prescriptions that may have a lower susceptibility to insect or disease.
 - i. For additional information, contact staff entomology or pathology specialists and consider valuable local knowledge.
5. Select the silvicultural prescription with the highest (PNW) and an acceptable level of risk of failure that can achieve the FMU objectives.
6. Record the silvicultural prescription in the Planning and Tracking system. See Attachment 1 of this procedure.

APPROVED BY: signed, May 2000
Rick Cooper, Manager

Lands and Resources Division

SEE ALSO:

GL 14-006-020	REFORESTATION GUIDELINES (under development)
PR 14-005-010	DEVELOPING FOREST MANAGEMENT UNIT OBJECTIVES
PR 14-005-020	IDENTIFYING AND PRIORITIZING STANDS FOR REGENERATION HARVEST
PR 14-006-040	CONTROLLING COMPETING VEGETATION
PR 14-006-050	PRE-COMMERCIAL THINNING
PR 14-006-060	PRUNING TREES
PR 14-006-070	WEST-SIDE SMALLWOOD THINNING PROCEDURES
PR 14-006-080	WEST-SIDE OLDER-STAND ASSESSMENT AND MANAGEMENT PROCEDURES
PR 14-006-090	LEGACY AND RESERVE TREE LEVELS FOR REGENERATION HARVEST UNITS (VARIABLE RETENTION HARVESTING)
PR 14-006-100	APPLYING FERTILIZERS (still under development)



[PR 14-005-060](#) ATTACHMENT 1

Format for a Silvicultural Prescription

This suggested format serves as a reminder for silvicultural prescription writers. It is not comprehensive nor should it be used as a "fill-in-the-blank" form. Its purpose is to get you started.

Overall Unit Objectives

This FMU will be managed to provide _____. It is within the _____ landscape planning unit and is managed under the 1992 FRP, 1997 HCP and the _____. This FMU will contribute _____, _____, and _____ to meet the objectives for the _____ landscape planning area. The present stand condition is _____. The desired future condition for the FMU is _____ with _____. This condition will be achieved by _____.

Timber Harvest Objective

The FMU will be managed using the _____ system. A _____ logging system will be used to _____ and _____. _____ trees per acre will be _____ distributed to _____. They will be retained for _____ years.

Special Features

General Comments

Unique features in this FMU include _____, _____, and _____. Additionally, the FMU is part of a _____ lease and has a _____ level of _____ use.	This area is accessed by the _____ road, which is _____. Adjacent landowners are interested in _____, _____, and _____.
---	---

Regeneration Objective

The FMU will be regenerated by _____ because it is _____ and _____. _____ species will be _____ in a mixture with _____ to achieve the _____.

Site Preparation and Vegetation/Pest Control Objectives

_____ and _____ are inhibiting growth and _____ and will cause _____ if they area not controlled. _____ was chosen as a treatment method because it is _____ and _____ while protecting _____. _____ has a PNW of _____ on this site.

PCT Objectives

_____ will be distributed in a _____ manner, except in areas of _____ where _____ will be favored. All _____ will be left and _____ per acre when available.

Fertilization and Pruning Objectives

_____ was chosen because of the _____ on this site. The site conditions warrant _____ because of _____ and _____.



PR 14-005-060

ATTACHMENT 2

Checklist for a Silvicultural Prescription

This checklist serves as a reference to help ensure that all issues within the test portions of silvicultural prescriptions have been thoroughly addressed. Is is organized in the same order as the text fields are presented in P&T.

Overall Unit Objectives

Did you address what the FMU will provide? Include:

- ☐ revenue (long or short term),
- ☐ habitat (for what specie(s)),
- ☐ recreational opportunities & impacts, (trails, firewood, camping, etc), and
- ☐ hydrological function.

Have you referenced the landscape and policy plans by including:

- ☐ names and dates of plans in place at the time of writing,
- ☐ landscape plan objectives that will be met by managing the FMU, and
- ☐ departures from landscape plans?

Did you review the infopac and briefly discuss the present stand condition? Include:

- ☐ site productivity (use site index or plant association),
- ☐ geomorphology descriptions, (aspect, slope, elevation, stability, etc.),
- ☐ risks to the stand (disease, insect, hazardous fuel conditions, etc.),
- ☐ structure and composition of live trees and dead wood, and
- ☐ habitat conditions (cubic feet of down wood, etc).

Have you outlined the desired future stand condition? Include:

- ☐ structure and composition of the FMU's vegetation over time,
- ☐ legacy and reserve tree plans,
- ☐ long- and short-term snag and down wood targets,

- ☐ age of the FMU when a regeneration harvest will be conducted,
- ☐ tree growth expectations, volume per acre, etc., and
- ☐ economic expectations for the FMU.

Are your statements:

- ☐ clear and concise (bullet statements work well), and
- ☐ measurable,(i.e., RD, MBF, cubic volume, snag class)?

Have you avoided:

- ☐ repeating large blocks of text from landscape or policy plans, and
- ☐ restating blocks of inventory information?

Special Features

Did you discuss:

- ☐ unique resource features (balds, talus, nest sites, snags, down wood, public use, visual attributes, large trees, unstable slopes, riparian management zones (RMZs) etc.),
- ☐ potential changes in future land use,
- ☐ predetermined objectives (grazing, public use, nesting, roosting, and foraging (NRF) and dispersal habitats), and
- ☐ efficiency efforts to meet the predetermined objectives?

General Comments

What did you say about:

- ☐ details regarding access issues,
- ☐ neighbor concerns and contact persons, and
- ☐ specialists involved in planning (include names/dates)?

Timber Harvest Objectives

Have you described the:

- ☐ type of silvicultural system and logging system to be used (include rationale for your choices),
- ☐ purpose of leaving legacy trees,
- ☐ duration of the legacy trees in the stand,
- ☐ distribution of legacy and/or leave trees, (i.e., clumped vs. uniform),
- ☐ skid trail design and re-use,
- ☐ trees per acre levels and/or relative density of the preferred specie(s),
- ☐ mitigation efforts used, and
- ☐ experience with similar stands?

Regeneration Objectives

Did you discuss:

- ☐ natural and or artificial options,
- ☐ desired species composition,
- ☐ target stocking, size and density at year five,
- ☐ site prep or vegetation control needs, and
- ☐ the present net worth (PNW) of the options considered?

Vegetation / Pest Control Objectives

Were you specific about:

- ☐ why certain species need control,
- ☐ how you would control these species,
- ☐ why you chose the scheduled techniques,
- ☐ the cost effectiveness of the options considered, and
- ☐ local constraints and considerations?

Pre-commercial Thinning (PCT) Objectives

Did you describe:

- ☐ distribution of the trees (uniform vs. clumped),
- ☐ species to favor (plus number of trees per acre (tpa) of other species),
- ☐ deformed tpa after PCT, and

☐ DNR Intensive Management Program Simulator (DNRIMPS) summary, including economics?

Fertilization and Pruning Objectives

Did you explain why you chose:

- ☐ treatment over no treatment, and
- ☐ the sites to respond with the desired result?

Prepared by

Did you put your name and the date in the text box?

PR 14-005-060

ATTACHMENT 3

A Sample Silvicultural Prescription

(Example #1 - A dry eastern Washington site.)

Overall Unit Objectives

Provide revenue to beneficiaries while maintaining the stand in "late-seral" condition, which is desirable for species that inhabit stands with large pine. Uneven-aged management practices will be used to maintain ponderosa pine on this site.

This unit is managed under the 1992 FRP and the 1997 HCP. there is currently no landscape plan that affects this sale.

This unit is on steep (60-70%) slopes of varying aspects, at about 2,600 feet elevation. Plant communities are not easily identifiable, but associations appear to include ponderosa pine series (PIPO/CARU-AGSP) and Douglas-fir/pinegrass (PSME/CARU). The sites are in the "Hot Dry Shrub/Grass" plant association group (Lillybridge et. al., 1995). Soil depth varies and is often thin; parent material is Chumstick formation.

The stand is aesthetically pleasing and may furnish habitat for species inhabiting older pine stands. Considerable merchantable volume is present, but tree growth is slow enough that long-term timber production is questionable. Future management will seek to provide habitat with occasional timber removal to enhance tree growth, stand structure, and forest health.

The current stand is uneven-aged; many of the older trees are about 250 years in age. It tends to be quite open and patchy. Ponderosa pine dominates the stand, but Douglas-fir is invading in places where soil moisture and aspect permit its growth. Current relative density is about 20-25, which apparently represents full stocking on this harsh site. Most of the pines are over-mature and many are infected with dwarf mistletoe. The mean annual increment of growth is declining. Rootrot pockets (believed to be Armillari) are present in places, affecting the pine. Ponderosa pine regeneration is virtually non-existent. Forest health problems will continue to increase in the absence of management, and invading Douglas-fir will eventually displace the pine in parts of the FMU.

Specifically we propose to:

- Create and maintain "legacies" of old, "yellow" ponderosa pine.
- Reduce Armillaria and dwarf mistletoe problems while regenerating pine.
- Restore and maintain an RD of 20-25 (represents full stocking on this site).
- Provide habitat for species indigenous to large pine stands.
- Maintain approximately 750-1,000 cu. ft./ac. of coarse woody debris.
- Provide continuing but limited revenue.
- Provide grazing for livestock.

Ann Hammill 7/99

Special Features

An endangered plant has been noted on a nearby FMU. No management activities associated with this unit are expected to impact the endangered plant. The stand has a large component of 250-year old "yellow" Ponderosa pine.

General Comments

This unit is located above a domestic water intake. Forester Keith Richmond had discussed the proposed timber sale with the rancher (John Broberg) who uses the water intake. Mr. Broberg is satisfied that the harvesting operation, if conducted as planned, will not harm his water source.

A.H. 7/99	A.H. 7/99
<p>Timber Harvest Objective Remove all merchantable Douglas-fir and thin the pines (including all risk trees) which are greater than 12" dbh. This will leave trees greater than 36" dbh (of which there are several per acre), and an average basal area of 35 sq. ft./ac. (from FVS simulations). FVS simulations indicate the residual stand would range from about 2" to 43" dbh. Individual tree marking will be geared to maintain the continued presence of "large, strutrally unique trees." Scattered clumps of residual trees are preferred over a uniform distribution, to preserve a semblance of the micro-climatic conditions of an undisturbed forest. Coarse wood debris will be left at the rate of at least 750-1,00 cu. ft./ac., to provide soil organic matter, substrate for beneficial soil microbes, ectomycorrhizae and habitat for a variety of prey species. Helicopter-logging is proposed to minimize site disturbance. A.H. and Larry Schiavo 8/99</p>	
<p>Regeneration Objective Helicopter-logging (causing less disturbance) may tend to discourage natural regeneration. However, there is currently a lot of exposed mineral soil so further disturbance for regeneration is not deemed necessary. Pine seed production years are sporadic, so regeneration will be slow in establishment, but planting is not economically (or operationally) feasible because of the harsh site conditions.</p>	

PR 14-005-060

ATTACHMENT 4**A Sample Silvicultural Prescription**

(Example #2 - Dispersal habitat on a western Washington site.)

<p>Overall Unit Objectives This FMU has a dual role and opportunity to provide dispersal habitat and revenue production. It is within the Columbia HCP planning unit. These objectives were written under the 1992 FRP and the 1997 HCP. The FMU contributes low quality habitat in its current condition. It is in a planning unit that needs additional dispersal habitat.</p> <p>The site index of 110 and 30 percent slope with a northerly aspect make this a productive site. The stand has no obvious pests, though small pockets of <i>Phellinus Weirii</i> are widely scattered in the stand. The stand is even-aged, between 33 and 38 years old and very dense (RD is 75). Limited understory vegetation is present becauase of the low light level. Large pieces of down wood are present and will continue to provide significant habitat function for many decades due to their size. Structure and vegetation composition are currently limited.</p> <p>The future stand will have much greater vertical structural diversity and a wider range of species present. Additionally, the horizontal diversity will increase through creation of different age cohorts in small patches. Shade tolerant western red cedar will be planted in the shady areas near edges and Douglas-fir will be planted in the high sunlight areas. In the near term, no additional down wood will be added except through mortality of small diameter trees,. Some snags, 10-12" dbh, will be created during the first logging entry, and sufficient numbers of trees will be left for future development of snags. Growth is expected to be maintained at maximum rates through density control and will be sustained well beyond age 100. Up to 90 trees per acre greater than 30" dbh are expected by age 80 to be interspersed with patches of smaller diameter trees of varied species. Epicormic branching will be present on some large trees and various crown heights will be interspersed throughout the stand. The FMU is expected to provide good economic returns from small wood through older-stand thinning and from the additional wood products cut as small patches are created. High value products will be removed after age 80 and functional dispersal habitat is expected by age 50. The stand may well produce functional NRF habitat after age 80.</p> <p style="text-align: right;">Jerry Jarvi 4/99</p>	
<p>Special Features The FMU is within the US 141 visual corridor and located in a mid-distance view position. Thus texture and shape are the factors which will be addressed in activity planning. Large down wood (> 36" in diameter and approximately 35 years old) is an attribute of this FMU. Special precautions must be taken to protect this resource. The unit is designated as</p>	<p>General Comments Access is from USFS 12. Permits must be obtained when heavy hauling is scheduled.</p> <p>A neighbor on the south side of the FMU is interested in our management activities. John Force and his wife Nancy are active in the local Audubon chapter, and have asked for the</p>

<p>contributing to dispersal habitat.</p> <p>Art Abramson and Dan Wilcox 5/99</p>	<p>opportunity to give input when the department is scheduling a management activity. They are available at 110 Old Hwy 141, Crystal Falls, WA (906) 822-7323.</p> <p>A. Abramson 6/99</p>
<p>Timber Harvest Objective</p> <p>This FMU will be managed using a mix of several silvicultural systems which will lead to variable densities intermingled throughout the stand. The systems are patch cutting in blocks less than five acres (typically are two acres or smaller). Several thinnings will be conducted over six decades in preparation for a regeneration harvest in approximately eight decades. The regeneration harvest will leave an overstory of large legacy trees and snags, and is expected to release some advance regeneration of shade tolerant species which will have established under the late thinning. Each harvest will enhance dispersal habitat.</p> <p>The harvest entry scheduled for 2001 is a smallwood thinning interspersed with patch cuts. A cable logging system with a locking carriage is necessary to complete the thinning and minimize damage. Patch cuts will be oriented to provide maximum sunlight along the length of the cut unit to facilitate growth of intolerant young trees. Root rot pockets will be pre-marked and all will become part of the patch cut mosaic. The initial thinning will be focused on density reduction to maintain good growth on the leave trees. Relative density levels, on the average, will be reduced to approximately 35. This is the most uniform spacing entry in the series of harvest entries, however RD levels will drop as low as 25 in certain areas and be as high as 45 in others. This will be accomplished by working closely with falling crews – training and certifying them in the use of density measurement tools. Areas which fall below RD 35 will be marked to preclude compliance problems. This variability in RD levels begins the process of establishing variable density levels while maintaining good growth. Specific legacy trees will not be identified in this early thinning. However, falling crews will be instructed to leave up to three trees per acre with upper crown irregularities to provide a variety of options for future legacy retention trees. Some bigleaf maple and vine maple is present in the stand. Falling crews will be instructed to preserve all vine maple and up to one bigleaf maple per acre. Any conifer other than Douglas-fir will be the favored specie when they are encountered in this thinning.</p>	

[Back to the Forestry Handbook Homepage](http://146.76.5.203/handbooks/forestry/Procedure%2014-005-060.htm)